



**National Aeronautics and Space Administration
Goddard Space Flight Center
Wallops Flight Facility**

Range Support Services Project Plan for USCG ScanEagle Payload Test



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CHANGE RECORD SHEET

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1.0 PROJECT OVERVIEW

1.1 INTRODUCTION

1.1.1 BACKGROUND AND STATUS

Background

Wallops Flight Facility (WFF) is providing range support services for the United States Coast Guard (USCG) ScanEagle Payload Test.

The USCG ScanEagle Payload Test is a series of evaluation flight scenarios that will provide data for various payload sensors. The sensors being tested include the Synthetic Aperture RADAR, Medium Wave Infrared Sensor and an EO 900 Electro Optical Sensor. This testing is ongoing and varies in complexity and scope resulting in system development cognitive learning for the USCG Research and Development Center (RDC).

The program is intended to lead to new technologies, tools, and methods to expand maritime domain awareness and disseminate actionable intelligence on maritime hazards and threats for extended periods utilizing Unmanned Aerial Systems (UAS).

The test platform for this series of payload sensor tests will utilize the ScanEagle UAS. The USCG has designated this platform the X-200. The X-200 is an expeditionary Intelligence, Surveillance and Reconnaissance (ISR) system that utilizes the low/medium altitude and high endurance provided by the ScanEagle UAS.

The X-200 model UAS has flown over 700,000 combat flight hours performing various U.S Navy missions. It has been successfully deployed on eighteen different classes of naval vessels and has demonstrated operations, including launch and recovery, from hulls as small as 18 meters in length.

Status

It has been determined that the most effective way to evaluate and test advance payload sensors is to launch from land and operate over water in a controlled environment. WFF has been selected to perform these demonstration flights because of the combination of segregated airspace, proximity to USCG assets at Chincoteague, Virginia and aviation and mission support assets provided by NASA.

The time period for this test will be 10-21 February 2014.

Documentation

The Principal Investigator (PI) has provided the following documents to NASA WFF:

USCG RDC sUAS Demonstration Planning

USCG ScanEagle Payload Test at NASA Wallops Flight Facility (Overview of Support Request), 10 July 2013

Request for UAS Operations Cost Estimate, 16 July 2013

Military Interdepartmental Purchase Request
MIPR #HSCGFT-14-X-P04004, 22 Oct 2013

Interagency Agreement (IAA) USCG – GSFC/WFF
IAA #28-14-FT4P04004, 4 Dec 2013

Project Category

As per NPR 7120.5, NASA Space Flight Program and Project Management Requirements, this project is considered Category 3, due to the project Life Cycle Cost (LCC) estimate being less than \$250 million (USD). This is shown in the Code 840 cost estimate in the WFF Launch Range Cost Tool archive in the Range Operations Management System (ROMS), with the priority level defined as Low.

1.2 OBJECTIVES

PI Objective

The primary goal of this program is to demonstrate and evaluate the effectiveness of various types of surveillance sensors on waterborne targets typically encountered on USCG missions.

WFF Range Support Services Objectives

WFF Range objectives are to provide project support for range functions sufficient to ensure smooth integration of WFF efforts and responsiveness to the PI's needs. Successful provision of these services will include:

- a. Requirements management in all areas of WFF responsibility
- b. Provision of cost, budget, technical plans, tracking, and reporting of status of same using WFF and/or PI-defined formats
- c. Development, maintenance, and execution of integrated schedules, including reviews and milestones required for test and flight approval from WFF
- d. Development and maintenance of agency or interdepartmental agreements obtaining required services from other entities when appropriate

WFF will provide the project with reliable instrumentation and support services.

Successful provision of these services may include, but are not limited to the provision of:

- a. Island Unmanned Aerial Vehicle (UAV) runway and operational access
- b. Airspace Management for R-6604 and Warning area coordination
- c. Trained emergency support personnel and equipment for possible aircraft or operational emergencies at WFF
- d. Range Safety related planning and documentation
- e. Range Surveillance
- f. Meteorological Weather Services
- g. Optical Services
- h. Ground Communications
- i. Accurate Telemetry (TM) Data Capture/Recording/Relay when applicable
- j. Range Radio Frequency (RF) Spectrum Management
- k. Control Center Services
- l. Aircraft Airworthiness Evaluation Support

NASA Strategic Goals

These experiments will also assist NASA by providing traceability to agency strategic goals outlined in NASA Strategic Goals 2011 through 2021 and beyond

NASA Strategic Goal 2: Expand scientific understanding of the Earth and the universe in which we live.

NASA Strategic Goal 4: Advance aeronautics research for societal benefit.

Schedule:

Action, Tasks and/or milestone		Suspense (days)
1	WFF will support team meetings/teleconferences with the PI	As Required
2	WFF and RDC to participate in Technical Interchange Meeting (TIM)	As Required
3	USCG RDC to provide WFF Project Plan concurrence	T-30
4	WFF Range Safety Plan (RSP)	T-30
5	WFF Missions Operations Directive (MOD) Draft	T-30
6	WFF and USCG to participate in Airworthiness Review	T-20
7	WFF and USCG to participate in Range Readiness Review (RRR)	T-7
8	WFF and USCG to participate in WFF island briefing	T-4
9	WFF and USCG to provide setup of Ground Control Station (GCS)	T-4

10	Approval to Proceed Review	T-1
11	WFF and USCG to participate in Pre-mission briefing	T-1
12	USCG Daily Pilots Briefing	Day of Test
13	USCG ScanEagle Payload test	Day of Test
14	NASA will provide any necessary test data to RDC	T+2

Cost

Based on previous missions of the same scope and complexity, the estimated cost of range services is \$89,575.00

Program Requirements and Constraints

The ScanEagle Test Demo has 63 flight hours allotted for completion of the flight test. This will consist of nine, 7-hour flights over a period of 10 days, 10-21 February. There will be no overtime or weekends involved during the test period.

Specific mission objectives, flight plans, and timelines will be published in the Mission Operations Directive (MOD).

1.3 MISSION DESCRIPTION AND TECHNICAL APPROACH

Mission Description

The ScanEagle Test Demo will be flown to test and evaluate various surveillance instruments. These instruments include the following:

- a. Synthetic Aperture RADAR
- b. Medium Wave Infrared Sensor
- c. EO 900 Electro Optical Sensor

The flights will be launched and recovered on the WFF UAV island runway. Various targets will be used to evaluate the effectiveness of each sensor. These targets include thermal Oscars (120 pound dummies with life jackets and gel packs to simulate the heat signature of humans), rafts, small boats (Carolina Skiffs) and Coast Guard (CG) Station Chincoteague boats. The USCG will be responsible for placement and recovery of targets.

Technical Approach

The ScanEagle UAS will be used as the test platform and includes the following components:

- a. Tracking antenna and antenna interface module (AIM)
- b. Omni antenna and omni interface module (OIM)
- c. Ground Control Station (GCS) trailer
- d. Insitu ScanEagle UAV – Block D aircraft configured with different payloads
- e. Super Wedge catapult launcher
- f. Skyhook recovery system
- g. Voice communication antenna assembly

The ScanEagle Test Demo will encompass multiple aircraft with different sensors, or combination of sensors being tested.

The sensors being demonstrated are as follows:

- Inverse Synthetic Aperture Radar (ISAR)
 - NanoSAR-C
 - Manufactured by ImSAR
- Electro Optical & Infrared (EO&IR)
 - Medium Wavelength Infrared Imager (MWIR) in Stabilized Turret
 - Manufactured by Hood Tech
 - Electro Optical 900
 - Manufactured by Hood Tech

Additional and more comprehensive platform specific technical information will be published in the respective Mission Operations Directive (MOD), Flight Safety Plan (FSP), and Ground Safety Plan (GSP).

1.4 PROJECT AUTHORITY, GOVERNANCE STRUCTURE, MANAGEMENT STRUCTURE AND IMPLEMENTATION APPROACH

1.4.1 PROJECT AUTHORITY

The Goddard Space Flight Center (GSFC) WFF Suborbital and Special Orbital Projects Directorate, Code 800, is the final authority for this project. The WFF Range and Mission Management Office (RMMO) is responsible for project management services and is the owner and developer of this plan. The Director of WFF, or his designee, will review all mission readiness information and status, and grant an approval to proceed prior to operations.

Technical Authority remains with USCG/RDC. Additional USCG/RDC responsibilities include but are not limited to: safe operation of all ScanEagle platforms and systems, provision of funding, provision of specific requirements, and attendance or representation in all required meetings.

1.4.2 GOVERNANCE STRUCTURE

Per NPR 7120.5 criteria, this project is a Category 3 project. Project status may be communicated via monthly scheduling and status meetings, as well as informal communications. Significant issues associated with this project will be communicated to GSFC management via the Monthly Status Review (MSR).

Problem reporting is accomplished using the WFF Range's existing ROMS to report, track, and document discrepancies, lessons learned, and risks. The ROMS database is a baseline Range system that is utilized by all RMMO managed projects to allow cross-project learning among project managers and the engineering support teams that utilize the range. ROMS can be accessed at <https://roms.wff.nasa.gov/>.

The Goddard Program Management Council (PMC) serves as the senior decision-maker body that baselines, assesses project performance, and ensures successful achievement of NASA strategic goals.

1.4.3 MANAGEMENT STRUCTURE

The GSFC/WFF Project Manager (PM) has full responsibility for all range support activities within the scope of this project and is responsible for the safe success of the project in accordance with NASA procedures, requirements, and directives. Such procedures, requirements, and directives take precedence over all contractual and other requirements under which individuals supporting the project may be employed.

The WFF Project Support Team (PST) supports the PM in accordance with NASA procedures and requirements. The PST membership is formally described using standard form Project Team Assignment List and Critical Staff List (840-PTAL Form -1), which identifies PST members by name and role.

Final approval to conduct operations of this project shall be granted by the Director of WFF or his designee and will be documented using the Approval to Proceed (ATP) form.

The WFF PM will respond to any dissenting opinions presented from others within WFF. In addition, anyone within WFF can share dissenting opinions with the Chief of RMMO, the WFF Director, or any higher level executive within NASA. If a dissenting opinion pertains to safety, anyone within WFF can also share their opinions with appropriate members of the NASA WFF Safety Office. Unresolved dissenting opinions within the project will be raised to the WFF Director for resolution.

Management oversight of the project will be maintained through various meetings and reviews to include USCG/RDC and WFF/RMMO.

The success of the USCG ScanEagle Payload Test project will have minimal impact on NASA resources. NASA Safety personnel assigned to this project will be working closely with the PI to identify and mitigate any safety issues.

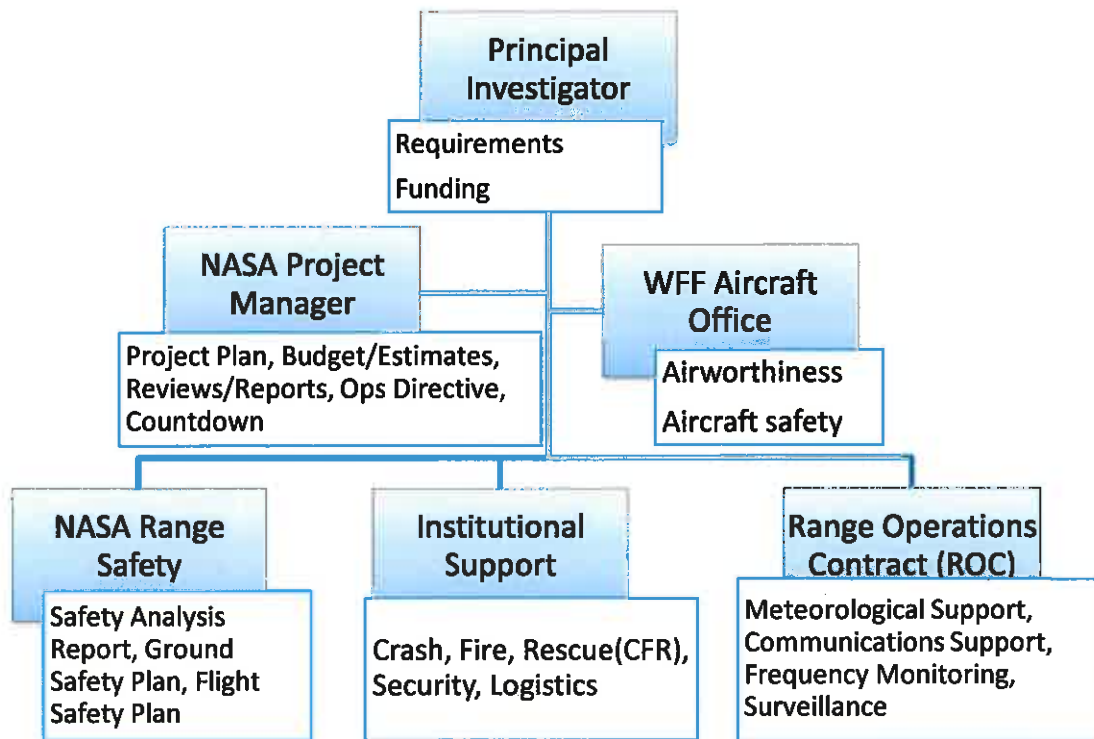


Figure 1.4.3 Organizational Structure

Organizational Roles and Responsibilities

The Principal Investigator: USCG/RDC

- Provide overall requirements
- Provide pilot and crew
- Provide ScanEagle Aircraft and safe operation thereof

The WFF Aircraft Office/Code 830 is responsible for providing the following:

- Executive Management
- Aviation Safety
- Airworthiness

The WFF RMMO/Code 840 is responsible for providing the following:

- Project Manager
- Business Management Functions
- Coordinating Range Logistic Support
- Organizing Range Control Services
- Safe implementation of operations as defined, reviewed, and approved

The WFF Safety Office/Code 803 is responsible for providing the following:

- NASA WFF Range Safety
- NASA Operations Safety Supervisor (OSS)
- Approved range safety risk analysis
- Approved range safety plan

Institutional Support is responsible for providing the following:

- CFR services (as needed)
- Security
- Logistics support (as needed)

The ROC is responsible for providing the following:

- Range Services Manager (RSM)
- Meteorological Support
- Communications Support
- Frequency Monitoring
- Surveillance

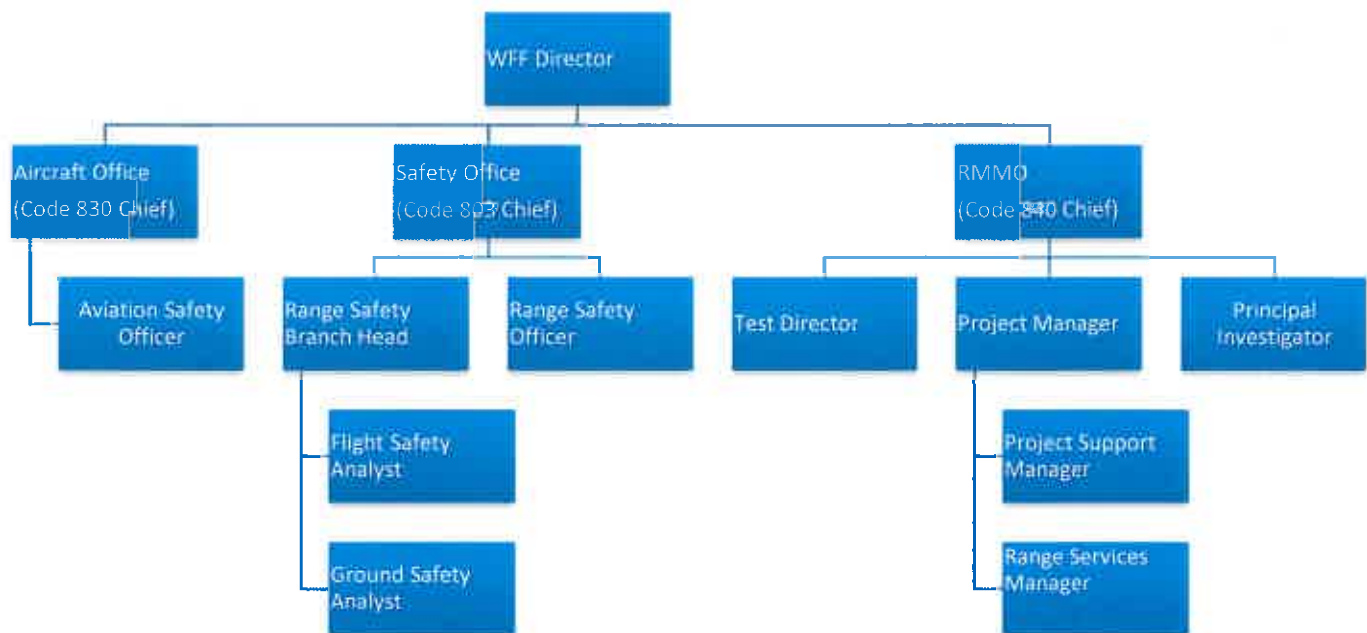


Figure 1.4.3a WFF Individual Assignments and Responsibilities

Individual Assignments and Responsibilities at WFF

The following definitions describe the roles and responsibilities of key personnel functionally reporting to the NASA Launch Decision Authority:

Flight Decision Authority The Director of WFF or his designee, is responsible for the review of all project requirements, safety plans, and review proceedings, and to grant final approval to proceed into flight operations via the Approval to Proceed (ATP) Review.

Aircraft Office Chief Is responsible for the airworthiness assessment of the flight vehicle.

Safety Office Chief Is responsible for all Safety Office elements and final approvals and for providing Code 803 confirmation of approval at the ATP Review.

RMMO Chief or designee Represents the Range on issues of policy and, as required, provides confirmation of Range approval to enter key operational areas and ATP.

Aviation Safety Officer (ASO) Reviews all generated risk assessments/hazard analyses and project documentation including the Range Safety Plan (RSP) that will be incorporated into the MOD.

Range Safety Branch Head Generates risk assessments, hazard analyses and project documentation including the RSP.

Flight Safety Analyst (FSA) Analyzes all risk associated with flight systems and provides input to the RSP.

Ground Safety Analyst (GSA) Analyzes all risk associated with ground support equipment and provides input to the RSP.

Range Safety Officer (RSO) Is responsible for assuring the test plan meets WFF safety policy and criteria, and assures that risks are understood and are within acceptable limits. He/she will establish hazard areas and mission criteria for project operations as defined in the project specific safety analysis documents. He/she has authority to stop the operation if necessary. The RSO also maintains safety program responsibility.

Test Director (TD) Has authority over all operations conducted on the WFF Range. He/she is responsible for assuring that all range policy, criteria, and external agreements are satisfied during the operations.

Project Manager (PM) Is responsible for the planning, coordinating and directing of operational range support services for the program and project activities and operations conducted at WFF Range. He/she is responsible for coordinating and directing activities as necessary during operations and establishing pre-operations clearance of Hazard Areas associated with WFF. He/she will apprise the TD and Range Safety Officer (RSO) of project status details and likewise keeps the project personnel properly informed of operational status. He/she also serves as Assistant TD.

Project Support Manager (PSM) Provides administrative and technical assistance to the PM.

Range Services Manager (RSM) Responsible for coordinating the planning of all aspects of range operations support for the project and assisting the PM in various tasks to include all ROC support.

Principal Investigator (PI) Is responsible for providing the overall test requirements and the test plan. Also provides all personnel and equipment needed to operate the ScanEagle as well as the targets in the water.

1.4.4 IMPLEMENTATION APPROACH

The Range Support Services for the USCG ScanEagle Payload Test program will follow standard NASA/WFF RMMO procedures for project implementation. Major tasks and milestones are listed under Section 1.2 of this document. Updates will be maintained and reported via periodic status reviews, the WFF range schedule, and communicated to team members during team meetings. Mission evaluation occurs throughout the life cycle of the project.

1.5 STAKEHOLDER DEFINITION

The PI for this program is with the USCG/RDC. The USCG sponsored ScanEagle Payload Test program is designed to demonstrate and evaluate the effectiveness of various sensors under test, on waterborne targets typically encountered on USCG maritime missions.

PI advocacy and concurrence with project activities throughout the life of this project are achieved in a number of ways, such as concurrence signatory to the Project Plan, Mission Operations Directive (MOD), as well as participation in the Range Readiness Review (RRR).

The PI will be asked to provide feedback. Lessons learned will be generated by RMMO from all feedback received. Advocacy will be ensured via a close working relationship between the project team and the PI. In addition, the feedback process will ensure that all positive or negative aspects associated with this project are identified and addressed in a timely manner.

2.0 PROJECT BASELINES

2.1 REQUIREMENTS BASELINE

The projects requirements for the WFF Range were discussed and agreed upon in a TIM and by formal approval through signatures on this document.

Any changes to the success criteria of Range Support Services objectives or to project requirements depicted in this document will be submitted as a revision to this project plan according to the significance of the change. Such changes will require approval of all respective signatories.

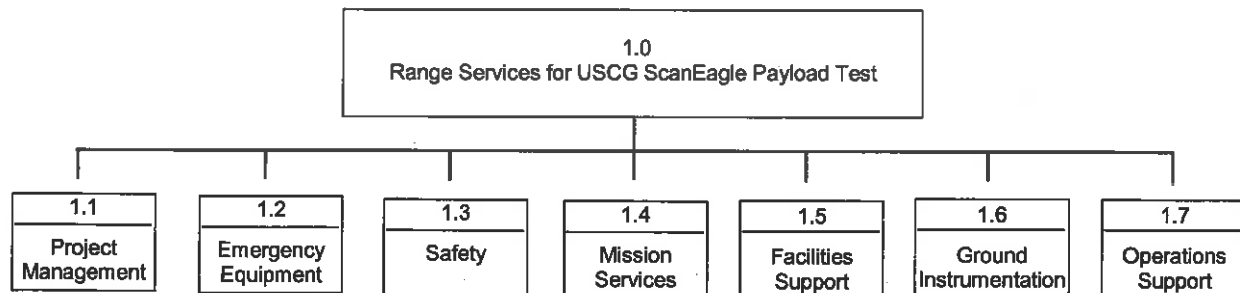
The status of range requirements will be tracked through RMMO by the PM.

Range requirements will be delegated to the appropriate operational range support personnel and managed at that level with accountability and oversight by the RMMO PM.

RMMO Requirements are as listed:

- Provide airfield crash, fire, rescue (CFR) support as necessary
- Provide range management support
- Provide administrative support
- Provide use of departure and arrival runway
- Provide briefing room with
 - Closed circuit TV
 - Wireless internet
 - Printer
- Provide ramp space for Mobile Operations Station (MOS)
- Provide ground communications radio support
- Provide access to island UAV runway
- Provide special use airspace access and Air Traffic Control (ATC) support
- Provide technician workspace if requested
- Provide Meteorological Support
- Provide video/photo support if requested
- Provide schedule support
- Provide coordinates of R6604 boundary

2.2 WORK BREAKDOWN STRUCTURE (WBS) BASELINE



1.0 Range Support Services for USCG ScanEagle Payload Test (total project)	This element is a roll-up segment level of the project, which includes project management, safety, platform mission review, ground and air safety review/planning, and operations support as appropriate.
1.1 Program Management	This element includes the management and administrative planning, organizing, directing, coordinating, controlling and approval actions designated to accomplish overall project objectives.
1.2 Emergency Equipment Fire/Rescue	This element includes the effort to track and analyze flight risk response requirements, to include flight emergency hardware and personnel; fire trucks, first responders.
1.3 Safety	This element includes the effort of directing and controlling the safety elements of the project such as: safety assessment, review, and verification of practices and procedures. This element <u>excludes</u> mission and product assurance efforts other than as a review/oversight function.
1.4 Mission Services	This element includes the geographic test area and directly related services to provide airspace and airport control as applicable.
1.5 Facilities Support	This element includes all facilities support associated with providing the project with the facilities and services required to integrate and test prior, during, and after mission.
1.6 Ground Instrumentation	This element includes the suite of equipment, hardware, software, networks, and project-unique facilities required to conduct mission operations.
1.7 Operations Support	This element includes the management of the development and implementation of personnel, procedures, documentation and training required to conduct mission operations.

2.3 SCHEDULE BASELINE

The schedule for operations will be posted on the Wallops Operations Scheduling System. The schedule availability is subject to change on a daily basis due to other NASA project activity and weather issues. Upon availability, the PM coordinates with support personnel to conduct operations.

USCG ScanEagle Payload Test requirements will be published in the associated MOD with any WFF constraints or inabilities to accommodate specific requirements. The PM will monitor accountable requirements from inception to project completion. Currently there are no constraints affecting the baseline.

See Section 1.2 for the task and milestone baseline.

2.4 RESOURCE

Funding Requirements

The USCG ScanEagle Payload Test Project Life Cycle Cost (LCC) estimate is based on prior projects of the same scope and complexity. Project activity is monitored and reported to NASA management and the PI via the Wallops Operations Scheduling System on a daily basis. Upon project completion, all project activities will be documented via the Project Summary Report.

Estimated costs and financial structuring for the USCG ScanEagle Payload Test can be found in the Code 840 Wallops Launch Range Cost Tool archive in ROMS. Charges will be assigned to Work Breakdown Structure (WBS) number 199008.02.04.01.S384.14. There are no infrastructure costs associated with this project.

Workforce Requirements

Estimates based on prior projects of the same scope and complexity is the basis for labor and procurements for FY 2014. Funding requirements are consistent with the program's WBS, and include funding for all cost elements required by WFF full-cost accounting procedures.

Civil Service labor charges will be tracked by the WFF Resources Office. Charges will be applied to a labor WBS number. Safety and Project Management contractor support will be charged as required, and tracked by the RMMO Project Manager.

The funding resources required to support this project are shown below:

<u>Cost Element</u>	<u>Provided by</u>
Engineering Services	NASA
Instrumentation Operations	ROC
Institutional Services	WICC

2.5 JOINT COST AND SCHEDULE CONFIDENCE LEVEL

The Joint Confidence Level (JCL) analysis is not required due to the project being less than \$250,000,000 dollars.

3.0 PROJECT CONTROL PLANS

3.1 TECHNICAL, SCHEDULE, AND COST CONTROL PLAN

The Range Support Services for the USCG ScanEagle Payload Test project establishes baselines in terms of schedule, budget, and technical performance. Review team members and review content are identified, selected and approved by the WFF RMMO Chief. Review team action items are reported to the PM, the RMMO Chief and the WFF Director; all of whom must certify disposition of findings prior to granting operational approval. In addition, the project team will support reviews as requested by the PI for the purpose of providing status or issues relating to range preparations and readiness.

This project's cost, schedule, and technical content management has been established through the RMMO. Project costs will be tracked by RMMO in accordance with RMMO policy and standard practices. The PM will periodically attend performance and technical cost reviews with the RMMO Chief to assure project progression and cost control accountability.

The technical authority for the MOS and UAS is USCG/RDC.

If the projected schedule and cost performance exceeds the baseline by 10 percent the PM shall report the variance to the RMMO Chief and this information shall be presented to USCG/RDC.

- Earned Value Management will not be used for this project.
- The project will not proceed until closure of actions at required reviews.
- Range support objectives and success criteria are described in Section 1.2.
- Section 1.4.3 addresses dissenting opinion.
- Technical schedule and cost status is reported during the MSRs.
- Project management requirements will be monitored and controlled by adherence to the related Mission Operations Directive (MOD).
- A project summary closeout report will be completed by the PM upon completion of the project.

3.2 SAFETY AND MISSION ASSURANCE PLAN

A stand-alone Range Safety Plan and Mission Operations Directive will be published for this project. This project will not utilize a formal mission assurance plan as a stand-alone document. RMMO and its supporting elements are not responsible for Mission Assurance. This will be provided by the USCG/RDC.

The project will manage a closed loop problem reporting and resolution system; this system monitors how the project develops, tracks, and resolves problems. It is accessed through the Range Operations Management System (ROMS).

The safety program development and implementation for the Range Support Services for the USCG ScanEagle Payload Test project is covered by NASA Aircraft Operations Management Manual (NPR 7900.3). Additional restrictions and safety guidelines for this project are referenced in the MOD for Range Support Services. Safety documentation in the form of a Range Safety Plan will be published prior to mission start day by the Safety Office (Code 803). On-site safety support will be provided by NASA/WFF representatives for both ground and flight safety.

NASA/WFF is responsible for range specific safety issues within this project's lifecycle while at WFF. Mission safety is divided into two organizational responsibilities; ground and flight safety.

The NASA Range Safety Plan is the overriding safety document for the project. Safety Plans will be tailored for the USCG ScanEagle Payload Test overall mission and published by Code 803 Safety Office.

The NASA/WFF Ground Safety Process (803-PG-8715.1.13) provides procedures and guidelines for ground safety engineering process performed by the WFF Code 803 Safety Office to provide range safety support.

The Flight Safety Team will establish operational hazard areas, flight safety limits and criteria for the project. The Flight Safety Office, in conjunction with the Test Director will coordinate and plan all surveillance activities. The NASA/WFF Flight Safety Process (803-PG-8715.1.12) provides procedures and guidelines for flight safety engineering process performed by the WFF Code 803 Safety Office to provide range flight safety support.

NASA/WFF Safety Office will prepare Risk Analysis Reports (RAR) for both Flight Safety and Ground Safety. These RARs will establish the safety program to be employed during various phases of the project. RARs will describe any hazards involved during testing, document the safety criteria and preventative measures, and establish a risk level to be accepted by NASA/WFF. RARs cover both ground and flight safety issues from an overall project perspective.

In addition to the RAR documentation, NASA/WFF will provide a Range Safety Plan for the project.

A NASA/WFF Range Safety Officer is an integral part of the core project team and maintains safety program responsibility.

3.3 RISK MANAGEMENT PLAN

The primary risks associated with the USCG ScanEagle Payload Test are in the areas of safety, weather, and schedule. In the event of a mishap, the NASA Wallops Flight Facility Research Range Mishap and Contingency Action Plan (PLAN-007346) will be utilized to inform appropriate authorities, emergency response organizations and management.

The primary safety risks are during takeoff and landing with a vehicle in-flight anomaly; or loss of control while airborne in the test area. Possible consequences include loss or damage to equipment and injury or death to personnel. These risks will be minimized by the RSP and the on-site OSS.

The primary programmatic risks include:

- **Weather**
The risk of weather is a dependency for many operations leading up to and including other project launches. This has the potential to affect schedule, forcing the test date to slip.
- **Schedule**
Given the high priority of other missions on the range, there is an expectation that activities associated with them may create issues for the USCG ScanEagle Payload Test project.

Programmatic risks will be monitored and mitigated where possible by the Project Manager. The PM has the responsibility to ensure that both quantitative and qualitative risk assessments be conducted and reported. The method for reporting the assessments are signed safety plans, approved RARs, and scalar-based risk tracking methodology.

USCG ScanEagle Payload Test will utilize the WFF RMMO Project Manager's Toolset Risk Reporting tool to track risks. The RMMO weekly and monthly status reviews, in combination with reviewing risks at all major reviews, will also be utilized for reporting risk.

3.4 ACQUISITION PLAN

All services to be procured for this project will use existing contracts with on-site support providers. A letter of request for range services for the USCG ScanEagle Payload Test with reference to Remote Controlled, Short Duration, Low Energy Uninhabited Aerial Vehicle is on file with the WFF Code 802 Advanced Projects Office. See Section 1.1.1 for additional documentation.

3.5 TECHNOLOGY DEVELOPMENT PLAN

NASA GSFC/WFF is not responsible for any technology insertions for this project.

3.6 SYSTEMS ENGINEERING MANAGEMENT PLAN

NASA GSFC/WFF is not responsible for any systems engineering management insertions for this project and does not require a stand-alone Systems Engineering Management Plan.

3.7 INFORMATION TECHNOLOGY PLAN

This project will manage technology throughout its life cycle in accordance with Managing Information Technology (NPR 2800.1); however, this project is not classified and NASA GSFC/WFF is not responsible for any Information Technology (IT) insertions for this project.

No new IT systems will be implemented to support this project - only existing systems will be used. This project will utilize the existing ROMS Lessons Learned database for knowledge capture, tracking, and review of lessons learned and communication.

3.8 SOFTWARE MANAGEMENT PLAN

NASA GSFC/WFF is not responsible for any software technology insertions and does not require a stand-alone Software Management Plan.

3.9 VERIFICATION AND VALIDATION PLAN

USCG/RDC will review this project plan, Safety Plans, and associated MOD for completeness, accuracy, and validation.

3.10 REVIEW PLAN

Review team members and review content are identified, selected and approved in accordance with the WFF RMMO Project Manager. Review team action items are reported to the Project Manager and the WFF RMMO Chief, both of whom must certify disposition of action items prior to requesting approval to proceed with operations. A review plan timeline can be found in Section 1.2 of this document.

3.11 MISSION OPERATIONS PLAN

Details of the mission's operations approach are in the MOD, which provides the guidelines for daily operations during flight preparation and test phase.

3.12 ENVIRONMENTAL MANAGEMENT PLAN

Activities conducted at all project locations will comply with NASA National Environmental Policy Act Management Requirements (NPR 8580.1) by implementing the National

Environmental Policy Act and Executive Order 12114. WFF UAS projects have been assessed in the Record of Environmental Consideration.

3.13 INTEGRATED LOGISTICS SUPPORT (ILS) PLAN

Shipments and delivery of project components, systems, aircraft and support equipment are the responsibility of USCG/RDC.

Logistics associated with visiting personnel, including security, badging, etc. will be provided by WFF under the leadership of the PM.

3.14 SCIENTIFIC DATA MANAGEMENT PLAN

Data collection, analysis, and dissemination will be managed by USCG/RDC.

3.15 INTEGRATION PLAN

USCG/RDC is responsible for any necessary integration plans.

3.16 CONFIGURATION MANAGEMENT

The USCG ScanEagle Payload Test mission operations will be conducted in accordance with this Project Plan, the MOD, and the Ground/Flight Safety Plans. The project will be monitored using the 840 Range and Mission Management toolkit (accessible through ROMS) throughout the life cycle of the project.

The Safety Office will develop Ground and Flight Safety Plans, which will specify the procedures and conditions required to effectively mitigate safety risks for the project. The NASA PM will retain and manage all relevant project documentation using both physical and electronic folders. Frequent meetings with the PI and key participants will ensure appropriate communication of documentation status. All documents will be maintained with version numbers and/or dates to ensure document configuration management. All changes to governing documents will be approved by the appropriate signatories of this plan.

This project plan is under change control as mandated by Configuration Management (GPR 1410.2), any non-administrative changes will be implemented by the WFF PM, concurred to by all signatories on the cover page, and described and recorded in the change record sheet within this document as well as a revision identifier assigned.

3.17 SECURITY PLAN

The Security Requirements for the USCG ScanEagle Payload Test are of unclassified nature. The Range team located at WFF and all subcontractors are to comply with Government requirements for industrial, physical, personnel; counterintelligence/counterterrorism, and information/ information technology security. NASA WFF and their support contractors are responsible for security training and refresher briefings to all civil-servant, students and support contractor personnel working on the Project.

For emergency response requirements this project will also be using Emergency Operations Plan (803-PLAN-0003) for WFF.

3.18 PROJECT PROTECTION PLAN

To date, WFF has not been the target for protests and does not see this changing due to this project.

3.19 TECHNOLOGY TRANSFER CONTROL PLAN

Export control requirements are not applicable to this project.

3.20 LESSONS LEARNED PLAN

WFF utilizes the Range Operations Management System's Lessons Learned Library which is located at <https://roms.wff.nasa.gov/lll/>.

The PM and project team will review past lessons learned during range operations at WFF and will apply lessons as appropriate. Lessons learned will be captured and document throughout the life cycle of this project.

3.21 HUMAN RATING CERTIFICATION PACKAGE

This is not a human space flight mission. A human rating certification package is not applicable.

3.22 PLANETARY PROTECTION PLAN

This project does not require planetary protection activities.

3.23 NUCLEAR SAFETY LAUNCH APPROVAL PLAN

No radioactive materials will be used in this project.

3.24 RANGE FLIGHT SAFETY RISK MANAGEMENT PROCESS DOCUMENTATION

The WFF Safety Office manages both the Ground and Flight Safety Groups and has assigned analyst from each functional area. The WFF Range Safety Operations Process (803-PG-8715.1) provides an overview of the roles, responsibilities, and procedures practiced by the Range Safety Team during operations.

WFF's Safety Office develops both the ground and flight safety documentation that is specific to this project. Within this documentation are specific sections that provide requirements that the project shall meet for the protection of public, workforce and property during operations. The Ground Safety Group within the Safety Office will identify and document the hazardous systems and system safeties, and define the WFF safety category for each hazardous system associated with this project. Project personnel are responsible for ensuring that industrial safety and Range Safety requirements are adhered to during operations. Range Safety personnel from the Ground Safety Group have authority delegated by the WFF Director to make decisions regarding interpretation of those safety requirements as they apply to vehicle preparation and launch activities. The Ground Safety Plan will address assembly operations, personnel restrictions, and other hazards unique to this project. The WFF Safety Office's Ground Safety process (803-PG-8715.1.13) provides an overview of the ground safety process.

The WFF Flight Safety Group within the WFF Safety Office will establish operational hazard areas, flight safety limits, and launch criteria for the launch operations. The Range Safety Officer is responsible for implementing the flight safety program for this project both in the planning phases and during operational activities. The WFF Safety Office's Flight Safety Process (803-PG-8715.1.12), provides an overview of the flight safety process. The Flight Safety Plan will document restrictions and limitations' being implemented to ensure the flight is conducted safely.

The Safety Office will develop a Risk Assessment Report to mitigate risk and to assist in developing all associated Safety Plans. Refer to Section 3.3.

3.25 EXPENDABLE LAUNCH VEHICLE (ELV) PAYLOAD SAFETY PROCESS DELIVERABLES

This project does not have an uninhabited orbital or deep space payload, NPR 8715.7 Expendable Launch Vehicle Payload Safety Program does not apply.

3.26 EDUCATION PLAN

There are no planned activities to enhance science, technology, engineering or math education using this project's technical content.

3.27 COMMUNICATIONS PLAN

Formal public communications and/or news conferences will not be solicited.

4.0 WAIVERS OR DEVIATIONS LOG

Currently there are no waivers or deviations associated with this project; however should the need arise, a request for waiver or deviation will be submitted to the WFF Director for review and approval.

5.0 CHANGE LOG

All changes to this Project Plan will be reflected in the Change Record Sheet located at the beginning of this document.

6.0 APPENDICIES

APPENDIX A: ACRONYMS

AIM	Antenna Interface Module	OSS	Operations Safety Supervisor
ASO	Aviation Safety Officer	PI	Principal Investigator
ATC	Air Traffic Control	PM	Project Manager
ATP	Approval to Proceed	PMC	Program Management Council
CFR	Crash, Fire, and Rescue	PST	Project Support Team
CG	Coast Guard	PTAL	Project Team Assignment List and Critical Staff List
CTO	Control Tower Operator	RAR	Risk Analysis Report
ELV	Expendable Launch Vehicle	RDC	Research & Development Center
EO	Electro-Optical	RF	Radio Frequency
EOC	Emergency Operations Center	RMMO	Range and Mission Management Office
EO&IR	Electro-Optical and Infrared	ROC	Range Operations Contract
GCS	Ground Control Station	ROMS	Range Operations Management System
GSFC	Goddard Space Flight Center	RRR	Range Readiness Review
IAA	Inter-Agency Agreement	RSM	Range Services Manager
ILS	Integrated Logistics Support	RSO	Range Safety Officer
ISAR	Inverse Synthetic Aperture Radar	RSP	Range Safety Plan
ISR	Intelligence, Surveillance, and Reconnaissance	SM	Security Manager
IT	Information Technology	sUAS	Small Unmanned Aircraft System
JCL	Joint Confidence Level	TD	Test Director
LCC	Life Cycle Cost	TIM	Technical Interchange Meeting
MIPR	Military Interdepartmental Purchase Request	TM	Telemetry
MOD	Mission Operations Directive	UAS	Unmanned Aerial System
MOS	Mobile Operations Station	UAV	Unmanned Aerial Vehicle
MWIR	Medium Wavelength Infrared Imager	USCG	United States Coast Guard
MSR	Monthly Status Review	WBS	Work Breakdown Structure
O&S	Operations and Support	WFF	Wallops Flight Facility
OIM	Omni Interface Module		
OSD	Operations and Safety Directive		

APPENDIX B: DEFINITIONS

No unique definitions have been identified for this project